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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/896,877	06/29/2001	Wendell P. Noble	MI22-1757	3354
21567	7590	04/27/2006	EXAMINER	
WELLS ST. JOHN P.S. 601 W. FIRST AVENUE, SUITE 1300 SPOKANE, WA 99201			GURLEY, LYNNE ANN	
			ART UNIT	PAPER NUMBER
			2812	

DATE MAILED: 04/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/896,877

Applicant(s)

NOBLE, WENDELL P.

Examiner

Lynne A. Gurley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-9, 40-53, 55-57 and 59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-9, 40-53, 55-57, and 59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.


Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


LYNNE A. GURLEY
PRIMARY PATENT EXAMINER
TC 2800, AU 2812

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the amendment filed 12/28/05.

Currently, claims 5-9, 40-53, 55-57 and 59 are pending.

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 5-9, 40-49, 51-53 and 56-57 and 59 are rejected under 35 U.S.C. 102(e) as being anticipated by Park et al. (US 5,840,591, dated 11/24/98, filed 11/30/95).

Park shows the method as claimed in figures 5-10 and corresponding text as forming a diffusion region (source/drain/node 126) in a semiconductive material 100, the diffusion region having an outer surface; forming a conductive line (subsequently doped polysilicon bit line 106)

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laterally spaced from the semiconductive material and diffusion region (by dielectric 102 in trench isolation region), a predominate portion of the conductive line being disposed elevationally below the diffusion region outer surface (fig. 5B); interconnecting the conductive line and the diffusion region with electrically conductive material (subsequently doped polysilicon or other conductive material 130); and wherein an entirety of the conductive line is laterally spaced from the semiconductive material (fig. 5B). The electrically conductive material 130 is over both the conductive line (or the conductive node) and the diffusion region. Forming the conductive node comprises forming a source/drain region 126/126'. Both the conductive line and the electrically conductive material are formed from different material and the same material (undoped polysilicon which is subsequently doped). Insulating material 130 (oxide) is between the conductive line and the conductive node and the semiconductive material. The formation of the electrically conductive material over both the conductive line (or the conductive node) and the diffusion region occurs after completing the forming of the diffusion region.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 50 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (US 5,840,591, dated 11/24/98, filed 11/30/95) in view of Lu et al. (US 4,983,544, dated 1/8/91) and further in view of Sung (US 5,753,551, dated 5/19/98, filed 11/25/96).

Park shows the method substantially as claimed, and as described in the previous paragraphs.

Park lacks anticipation only in not teaching that the forming of the conductive line and the electrically conductive material comprises forming both from refractory metals; and, that the outer surface of the diffusion region comprises an uppermost surface, wherein the conductive line comprises an uppermost surface which is coplanar with the uppermost surface of the diffusion region.

Lu teaches a refractory metal silicide interconnect between the diffusion/node region and the conductive line.

Sung teaches that the conductive bitline 6/7 may be made of refractory metal and polysilicon.

It would have been obvious to one of ordinary skill in the art to have formed the conductive line and the electrically conductive material comprises forming both from refractory metals, in the method of Park, with the motivation that Lu and Sung teach and suggest that conventionally the conductive line and the interconnect are formed of refractory metal, so the

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formation of both from a refractory metal would be both reasonable in regards to similar or comparable performance of the device.

It would have been obvious to one of ordinary skill in the art to have had the outer surface of the diffusion region comprise an uppermost surface, wherein the conductive line comprises an uppermost surface which is coplanar with the uppermost surface of the diffusion region, in the method of Park with the motivation that both Sung and Lu teach the conductive line to be coplanar with the diffusion region as a matter of design choice.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 7-9 and 51-53 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-18 and claims 1-12 of U.S. Patent No. 6,403,429 and 6,300,204. Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter is coextensive. The US patents, in teaching the formation of an isolation oxide region, which is partially removed in order to accommodate a conductive line in the partially removed portion, are coextensive with the instant

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claimed invention so that the entirety of the conductive line is laterally spaced from the semiconductive material, since the conductive line is deposited into the isolation region. The planarization of the conductive line with the diffusion region or node region is an obvious variation.

Response to Arguments

9. Applicant's arguments filed 12/28/05 have been fully considered but they are not persuasive.

10. In response to Applicant's remarks, page 10, regarding Lu, there are two references to "layer 14" in the patent: the titanium layer on the top of the substrate; and, the layer on top of the epitaxial silicon layer 12. Clearly, the layer 14 on top of the epitaxial silicon layer 12 is a semiconductive active layer and not a titanium layer, otherwise the device structure 20/20B with diffusion layers 24 would not be operable in a titanium layer and would be shorted together. Therefore, clearly, the labeling of the layer 14 on the epitaxial layer is a typographical layer. To clarify the record and the Examiner's position, Applicant has overcome the Lu reference only by the second argument that "the polysilicon 32 of Lu is a storage node" not a conductive line.

11. In response to Applicant's remarks, pages 10-11, regarding Park, along the same vein as the position presented above for Liu, clearly, the reference number "100" shown in Fig. 5C surrounding buried bitline "106" is clearly a typographical error. "100" is referenced in the same figure 5C for the substrate. The Examiner maintains the position that the bitline 106 is entirely laterally spaced from the semiconductive material by "107", "108" and "105", which are all insulative layers. See figures 9-10 as well for support.

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In response to Applicant's remarks regarding the obvious double patenting rejections, the rejections pertaining to US 6,403,429 and US 6,300,204 have been maintained. The Examiner has reviewed Applicant's reasoning. However, even though the earliest parent case may be in common, there have been a number of continuing and divisional cases filed and patented with obviously similar claims as the currently claimed invention, drawn to the same invention, narrower in scope in some cases than the currently claimed invention, which leads the Examiner to believe that the currently claimed invention clearly could have been presented in these earlier applications. The Examiner sees the current claims filed as an unnecessary extension of the coverage of the patents already issued with similar claims, and cannot overlook the fact that it is only reasonable for Applicant to file terminal disclaimers to overcome the rejection.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See the PTO Form 892 for similar prior art showing fabrication of bitline structures in isolation regions, which are interconnected to diffusion regions.

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

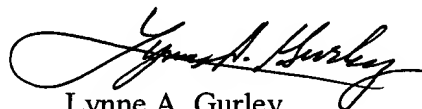
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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne A. Gurley whose telephone number is 571-272-1670. The examiner can normally be reached on M-F 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on 571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Lynne A. Gurley
Primary Patent Examiner
Art Unit 2812

LAG
April 24, 2006